CLAIMS

1. A method for suppressing power fluctuation of a high-efficiency combined power generation system that uses a byproduct gas generated in a plant, the method comprising:

adding a high-calorific-value substance having a calorific value higher than that of the byproduct gas so as to increase both the total calorie per unit of time and the calorific value per unit gas quantity up to predetermined targets; and

adding a low-calorific-value substance having a calorific value lower than that of the byproduct gas so as to control the caloric value and/or the composition of the power generation fuel,

whereby the total calorie and the calorific value are controlled within predetermined ranges.

2. The method for suppressing power fluctuation according to claim 1, wherein the high-calorific-value substance is at least one selected from the group consisting of a natural gas, a coke oven gas, and an off-gas from petroleum refinery processes.

3. The method for suppressing power fluctuation according to claim 1, wherein the low-calorific-value substance is at least one selected from the group consisting of a low-calorific value byproduct gas having a calorific value lower than that of the byproduct gas, a gas that, when mixed with

the byproduct gas, gives an oxygen concentration of a mixed gas lower than the inflammable limit, a combustion exhaust gas, and an excess nitrogen gas in the plant.

4. A method for suppressing power fluctuation of a high-efficiency combined power generation system that uses a byproduct gas generated in a plant, comprising

alternately switching charge/discharge modes of at least two storage apparatuses to suppress the power fluctuation.

5. The method for suppressing power fluctuation according to claim 4, wherein a high-calorific-value substance having a calorific value higher than that of the byproduct gas is added to increase the power when the power supplied to a site outside the plant is deficient so that the power supply becomes coincident with a demand pattern.

6. The method for suppressing power fluctuation according to claim 4, wherein, when the power supplied to a site outside the plant is excessive, the excess power is converted into storable energy and stored so that the power supply becomes coincident with a demand pattern.

7. The method for suppressing power fluctuation according to claim 6, wherein the excess power is used to electrolyze water and stored in the form of oxygen and hydrogen.

8. The method for suppressing power fluctuation according to claim 6, wherein the hydrogen gas obtained in claim 7 is

further converted into at least one selected from the group consisting of methanol and dimethyl ether.

9. The method for suppressing power fluctuation according to claim 1, wherein the high-calorific-value substance comprises at least one selected from the group consisting of the methanol and the dimethyl ether converted in claim 8.

10. The method for suppressing power fluctuation according to claim 1 or 4, wherein the byproduct gas comprises at least one selected from the group consisting of a blast-furnace gas, a basic oxygen converter gas, and a coke oven gas.

11. The method for suppressing power fluctuation according to claim 1 or 4, wherein the high-efficiency combined power generation facility comprises at least one selected from the group consisting of a gas-turbine steam combined power generator and a fuel-battery steam combined power generator.

12. The method for suppressing power fluctuation according to claim 1 or 4, wherein the deficiency of power that occurs during the time required for a standby generator to start operation upon shutdown of the high-efficiency combined power generation system or during the time required for the shutdown high-efficiency combined power generation system to restart is backed up by the storage apparatus previously charged.

13. A power generation facility comprising:

a high-efficiency combined power generation system that uses a byproduct gas generated in a plant as the fuel; and

an apparatus for adjusting the total calorie and the calorific value of the power generation fuel within predetermine ranges, in which a high-calorific-value substance having a calorific value higher than that of the byproduct gas is used to increase both the total calorie per unit of time and the calorific value per unit gas quantity up to predetermined targets and in which a low-calorific-value substance having a calorific value lower than that of the byproduct gas is used to control the caloric value and/or the composition of the power generation fuel.

14. The power generation facility according to claim 13, further comprising at least two storage apparatuses connected to the facility, wherein the charge mode and the discharge mode of the at least two storage apparatuses are switched alternately.

15. The power generation facility according to claim 13, further comprising a system for electrolyzing water connected to the facility.

16. The power generation facility according to claim 13, wherein the high-efficiency combined power generation system is at least one selected from the group consisting of a gas-turbine steam combined power generator and a fuel-battery

steam combined power generator.